

REMARKS/ARGUMENTS

Claims 1, 3–21, 23–27, and 29 are pending in the above-captioned application. Claims 1, 3–21, 23, 27, and 29 stand rejected, while claims 24–26 stand withdrawn by the Examiner. With this paper, claims 1 and 29 have been amended. No new matter was added with the amendment.

I. Claim rejections under 35 U.S.C. § 102(b) as being anticipated by Weigl et al. (1999 *Science* 283:346–347)

Claims 1, 3, 5, 23, and 27 were rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Weigl et al. (1999 *Science* 283:346–347). “[F]or anticipation under 35 U.S.C. § 102, a single reference must teach every aspect of the claimed invention either explicitly or impliedly. Any feature not directly taught must be inherently present.” MPEP § 706.02. “The identical invention must be shown in as complete detail as is contained in the . . . claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, USPQ2d 1913, 1920 (Fed. Cir. 1989).

With regard to claim 1, at a minimum, Weigl et al. do not teach “flowing the at least one second component or the set of second components that binds to the at least one first component or the set of first components out of the first channel and into a second channel” or “detecting within a third channel a concentration of the at least one first component or the set of first components that remains unbound after exiting from the first channel into the third channel.”

That bound components exit the first channel into a second channel is supported, for example, by Applicants’ Figure 6 and by the text describing Figure 6 in paragraphs 0103 through 0105 on pages 28 and 29 of Applicants’ specification. A first channel is illustrated in Figure 6 at **600**, and a second channel is illustrated in Figure 6 at **610**. That detection takes place within a third channel into which unbound components exit is also supported by Applicants’ Figure 6 and by the text describing Figure 6 in paragraphs 0103 through 0105 on pages 28 and 29 of Applicants’ specification. A third channel is illustrated in Figure 6 at **608**, and a detector is illustrated in Figure 6 at **606**.

Applicants request that the Examiner compare the T-sensor of Weigl et al. with the illustrative microfluidic device of Applicants' Figure 6. Weigl et al. make clear that reacted molecules are detected. In column 3, on page 346, beginning at 17 lines from the bottom, Weigl et al. teach, "As interdiffusion proceeds, interaction zones are formed in which sample and reagents may bind and react. Typically an indicator changes color or fluorescence intensity upon interdiffusion and reaction with analyte molecules." Thus, Weigl et al. teach detecting a bound and reacted component rather than an unbound component or set of components.

Figure 1 of Weigl et al. makes clear that detection takes place within the one and only channel in which binding takes place. As seen in Figure 1, this single channel ends in a waste compartment. Therefore, not only do the bound and unbound compounds not exit the first channel into second and third channels, respectively, but the only way to detect a compound after it exits the reaction channel of Weigl et al. is to detect it within the waste compartment.

Thus, Weigl et al. do not teach every aspect of the claimed invention either explicitly or impliedly, nor do they show the identical invention claimed by Applicants in as complete detail as is contained in independent claim 1. Withdrawal of the rejection of claim 1 under § 102(b) as being anticipated by Weigl et al. is, therefore, respectfully requested.

Claims 3, 5, 23, and 27 depend directly from claim 1. Therefore, Applicants respectfully submit that these dependent claims are allowable for at least the same reasons as set forth herein with respect to claim 1. Withdrawal of the rejection of dependent claims 3, 5, 23, and 27 under § 102(b) as being anticipated by Weigl et al. is also respectfully requested.

II. Claim rejections under 35 U.S.C. § 102(a) as being anticipated by Kamholz et al. (1999 *Anal Chem* 71:5340–5347) as evidenced by Mastro et al. (1984 *PNAS* 81:3414–3418)

Claims 1, 3, 7–15, 20, 21, 23, 27, and 29 were rejected under 35 U.S.C. § 102(a) as allegedly being anticipated by Kamholz et al. (1999 *Anal Chem* 71:5340–5347) as evidenced by Mastro et al. (1984 *PNAS* 81:3414–3418).

With regard to independent claims 1 and 29, at a minimum, Kamholz et al. and Mastro et al. do not teach "flowing the at least one second component or the set of second components that binds to the at least one first component or the set of first components out of the first channel and into a second channel" or "detecting within a third channel a concentration of

the at least one first component or the set of first components that remains unbound after exiting from the first channel into the third channel.”

Kamholz et al. do not teach detecting an unbound component or set of components. In column 1, on page 5340, lines 7–11, Kamholz et al. teach, “In a simple form of T-sensor, the concentration of a target analyte is determined by measuring fluorescence intensity in a region where the analyte and a fluorescent indicator have interdiffused.” See also page 5343, column 2, lines 14–16, in which Kamholz et al. state, “The extent of binding for a range of AB580 and HSA concentrations was determined based on fluorescence measurements made using a fluorometer” Kamholz et al. also teach on page 5345, column 2, lines 10–12, “the measured emission intensity is the sum of fluorescence from the complex” Therefore, Kamholz et al. teach detecting an analyte-indicator complex rather than an unbound component or set of components.

Kamholz et al. also do not teach detecting a concentration of a component or set of components that remains unbound after exiting from the first channel into a third channel. Figure 1 of Kamholz et al. illustrates that detection takes place within the one and only channel in which diffusion takes place. Nothing in Kamholz et al. suggests flowing bound and unbound compounds out of this channel into second and third channels, respectively, or taking measurements after components have exited the channel in which diffusion takes place.

Mastro et al. do not provide the teachings Applicants have shown above to be missing from Kamholz et al. Therefore, Kamholz et al. as evidenced by Mastro et al. do not teach every aspect of the claimed invention either explicitly or impliedly, nor do they show the identical invention claimed by Applicants in as complete detail as is contained in independent claims 1 and 29. Withdrawal of the rejection of claims 1 and 29 under § 102(a) as being anticipated by Kamholz et al. as evidenced by Mastro et al. is, therefore, respectfully requested.

Claims 3, 7–15, 20, 21, 23, and 27 depend directly from claim 1. Therefore, Applicants respectfully submit that these dependent claims are allowable for at least the same reasons as set forth herein with respect to claim 1. Withdrawal of the rejection of dependent claims 3, 7–15, 20, 21, 23, and 27 under § 102(a) as being anticipated by Kamholz et al. as evidenced by Mastro et al. is also respectfully requested.

III. Claim rejections under 35 U.S.C. § 103(a) as being unpatentable over Weigl et al. (1999 *Science* 283:346–347) or Kamholz et al. (1999 *Anal Chem* 71:5340–5347) as evidenced by Mastro et al. (1984 *PNAS* 81:3414–3418) in view of Suzuki et al. (1999 *JBC* 274:31131–31134)

Claims 1, 3–21, 23, 27, and 29 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over either of Weigl et al. (1999 *Science* 283:346–347) or Kamholz et al. (1999 *Anal Chem* 71:5340–5347) as evidenced by Mastro et al. (1984 *PNAS* 81:3414–3418), each taken separately in view of Suzuki et al. (1999 *JBC* 274:31131–31134). The rejection of these claims is respectfully traversed.

To warrant rejection under 35 U.S.C. § 103(a), all the claim limitations must be taught or suggested by the prior art. See MPEP § 2142. As demonstrated above, the Weigl et al., Kamholz et al., and Mastro et al. references, taken singly or combined, do not teach or suggest “flowing the at least one second component or the set of second components that binds to the at least one first component or the set of first components out of the first channel and into a second channel” or “detecting within a third channel a concentration of the at least one first component or the set of first components that remains unbound after exiting from the first channel into the third channel.” Therefore, these three references neither teach nor suggest all of the limitations of independent claims 1 and 29. The Examiner does not assert that Suzuki et al. provide the missing teachings, and, in fact, Suzuki et al. do not.

Therefore, claims 1 and 29 are nonobvious over the cited references alone or in combination. Claims 3–21, 23, and 27 depend directly from claim 1. Any claim depending from a nonobvious claim is also nonobvious. See MPEP § 2143.03 and *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). Thus, dependent claims 3–21, 23, and 27 are nonobvious. Withdrawal of the rejection of these claims as being unpatentable over either of Weigl et al. or Kamholz et al. as evidenced by Mastro et al. (1984 *PNAS* 81:3414–3418), each taken separately in view of Suzuki et al. is, therefore, respectfully requested.

Conclusion

For the foregoing reasons, Applicants believe all the pending claims are in condition for allowance and should be passed to issue. If the Examiner feels that a telephone conference would in any way expedite the prosecution of the application, please do not hesitate to call the undersigned attorney.

Respectfully submitted,



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